

ABSTRACT OF THE DISCLOSURE

An improved wave energy converter for use in offshore and deep-sea locations. The wave energy converter is adapted for secure attachment to the bottom of a body of water (e.g., the ocean floor), preferably beyond the breaker zone. The wave energy converter is selectively adjustable in length. A hydraulic power generation system is used to convert the energy present in the waves into hydraulic power that can be use to generate electricity and for other purposes, such as desalinization. The system may include a hydraulic piston assembly, a floatation device that is connected to the piston assembly, high and low pressure hydraulic reservoirs, and a hydraulically driven power generator. The floatation device moves upward in response to rising waves, and downward under the force of gravity in response to falling waves. The system utilizes this downward gravitational force to discharge fluid from the piston assembly, which in turn, drives the power generator. A control system is used to detect water conditions and to selectively adjust the length of the support structure and the fluid flow characteristics to dynamically optimize power generation based on changing water conditions.